

CLAIMS

1. A recording apparatus, comprising:

5 a recording section for recording information onto a recording medium;

 a file system processing section for managing the information as a file using file system information having a directory hierarchy structure capable of being referenced using a path name;

10 a contents management information processing section for managing the directory and the file using contents management information; and

 an extension information processing section for managing extension information with respect to the directory and the file,

15 wherein the contents management information includes:

 media object management information for referencing the directory and the file using object reference information obtained by converting the path name; and

 extended object management information for managing
20 the extension information,

 wherein the directory and the file are associated with the extension information via the object reference information.

2. The recording apparatus according to claim 1, wherein the extended
25 object management information includes consistency state management information for managing a state of the directory and the file with the extension information corresponding thereto, and

 when an operation is performed with respect to the directory and the file, the extension information of a type that can be processed is
30 updated, the extension information of a type that cannot be processed is

not updated, and the consistency state management information is updated depending on a state of the consistency of the directory and the file with the extension information.

5 3. The recording apparatus according to claim 2, wherein

the consistency state management information is provided for each media object management information, and

the consistency state management information includes, for each extension information, at least information indicating the presence or
10 absence of reference relationship from the extension information to the directory and the file, and information indicating whether or not the consistency of the directory and the file with the extension information corresponding thereto is assured.

15 4. The recording apparatus according to claim 1, wherein

the contents management information includes first update date-and-time information,

the extension information includes second update date-and-time information,

20 when the media object management information is updated, the first update date-and-time information is updated, the same value of that of the first update date-and-time information is set to the second update date-and-time information of the extension information of a type that can be processed, and the second update date-and-time information
25 of the extension information of a type that cannot be processed is not updated.

5. A recording method, comprising:

recording contents information as a file onto a recording medium
30 using file system information having a directory hierarchy structure

capable of being referenced using a path name;

recording contents management information for managing the directory and the file, onto the recording medium; and

recording extension information with respect to the directory and
5 the file, onto the recording medium,

wherein the contents management information includes:

media object management information for referencing the directory and the file using object reference information obtained by converting the path name; and

10 extended object management information for managing the extension information,

wherein the recording method comprises associating the directory and the file with the extension information via the object reference information.

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6. The recording method according to claim 5, wherein the extended object management information includes consistency state management information for managing a state of the directory and the file with the extension information corresponding thereto, and

20 when an operation is performed with respect to the directory and the file, the recording method comprises updating the extension information of a type that can be processed, and updating the consistency state management information depending on a state of the consistency of the directory and the file with the extension information.

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7. The recording method according to claim 6, wherein

the consistency state management information is provided for each media object management information, and

the consistency state management information includes, for each
30 extension information, at least information indicating the presence or

absence of reference relationship from the extension information to the directory and the file, and information indicating whether or not the consistency of the directory and the file with the extension information corresponding thereto is assured.

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8. The recording method according to claim 5, wherein

the contents management information includes first update date-and-time information,

the extension information includes second update date-and-time
10 information,

the recording method comprises:

updating the media object management information;

updating the first update date-and-time information; and

setting the same value of that of the first update
15 date-and-time information to the second update date-and-time
information of the extension information of a type that can be processed.

9. A recording medium recording information, recorded with:

file system information for managing the information as a
20 directory hierarchy structure capable of being referenced using a path
name;

contents management information for managing the directory
and the file; and

extension information with respect to the directory and the file,
25 wherein the contents management information includes:

media object management information for referencing the
directory and the file using object reference information obtained by
converting the path name; and

extended object management information for managing
30 the extension information,

wherein the directory and the file are associated with the extension information via the object reference information.

10. The recording medium according to claim 9, wherein the extended
5 object management information includes consistency state management information for managing a state of the directory and the file with the extension information corresponding thereto.

11. The recording medium according to claim 10, wherein
10 the consistency state management information is provided for each media object management information, and
the consistency state management information includes, for each extension information, at least information indicating the presence or absence of reference relationship from the extension information to the
15 directory and the file, and information indicating whether or not the consistency of the directory and the file with the extension information corresponding thereto is assured.

12. The recording medium according to claim 9, wherein
20 the contents management information includes first update date-and-time information,
the extension information includes second update date-and-time information,
when the consistency of the directory and the file with the
25 extension information corresponding thereto is assured, the same value is recorded in the first update date-and-time information and the second update date-and-time information.

13. A reproduction apparatus for reproducing information from the
30 recording medium according to claim 10 or 11, the apparatus comprising:

a reproduction section for reproducing the information from the recording medium;

a file system processing section for processing the file system information;

5 an extension information processing section for processing the extension information; and

a contents management information processing section for processing the contents management information,

wherein when processing the extension information
10 corresponding to the directory and the file, the extension information processing section determines a procedure for processing the extension information according to a value set in the consistency state management information.

15 14. A reproduction apparatus for reproducing information from the recording medium according to claim 12, the apparatus comprising:

a reproduction section for reproducing the information from the recording medium;

a file system processing section for processing the file system
20 information;

an extension information processing section for processing the extension information; and

a contents management information processing section for processing the contents management information,

25 wherein when processing the extension information corresponding to the directory and the file, the extension information processing section determines a procedure for processing the extension information according to whether or not the first update date-and-time information matches the second update date-and-time information.

15. A reproduction method for reproducing information from the recording medium according to claim 10 or 11, the method comprising:
- reproducing the information from the recording medium;
 - processing the file system information;
 - 5 processing the extension information; and
 - processing the contents management information,
- wherein the step of processing the extension information comprises determining a procedure for processing the extension information according to a value set in the consistency state
- 10 management information before processing the extension information corresponding to the directory and the file.
16. A reproduction method for reproducing information from the recording medium according to claim 12, the method comprising:
- 15 reproducing the information from the recording medium;
 - processing the file system information;
 - processing the extension information; and
 - processing the contents management information,
- wherein the step of processing the extension information
- 20 comprises determining a procedure for processing the extension information according to whether or not the first update date-and-time information matches the second update date-and-time information before processing the extension information corresponding to the directory and the file.
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17. A program for controlling a recording operation of a recording apparatus for recording information onto a recording medium, the program comprising an instruction for causing the recording apparatus to execute:
- 30 recording contents information as a file onto a recording medium

using file system information having a directory hierarchy structure capable of being referenced using a path name;

recording contents management information for managing the directory and the file, onto the recording medium; and

5 recording extension information with respect to the directory and the file, onto the recording medium,

wherein the contents management information includes:

media object management information for referencing the directory and the file using object reference information obtained by
10 converting the path name; and

extended object management information for managing the extension information,

wherein the program further comprises an instruction for causing the recording apparatus to execute associating the directory and the file
15 with the extension information via the object reference information.

18. The program according to claim 17, wherein the extended object management information includes consistency state management information for managing a state of the directory and the file with the
20 extension information corresponding thereto, and

when an operation is performed with respect to the directory and the file, the program comprises an instruction for causing the recording apparatus to execute updating the extension information of a type that can be processed, and updating the consistency state management
25 information depending on a state of the consistency of the directory and the file with the extension information.

19. The program according to claim 18, wherein
the consistency state management information is provided for
30 each media object management information, and

the consistency state management information includes, for each extension information, at least information indicating the presence or absence of reference relationship from the extension information to the directory and the file, and information indicating whether or not the consistency of the directory and the file with the extension information corresponding thereto is assured.

20. The program according to claim 17, wherein
the contents management information includes first update
10 date-and-time information,
the extension information includes second update date-and-time
information,
the program comprises an instruction for causing the recording
apparatus to execute:

15 updating the contents management information;
updating the first update date-and-time information; and
setting the same value of that of the first update
date-and-time information to the second update date-and-time
information of the extension information of a type that can be processed.

20 21. A program for controlling a reproduction operation of a reproduction apparatus for reproducing information from the recording medium according to claim 10 or 11, the program comprising an instruction for causing the reproduction apparatus to execute:

25 reproducing the information from the recording medium;
processing the file system information;
processing the extension information; and
processing the contents management information,
wherein the program comprises an instruction for causing the
30 reproduction apparatus to execute, in the step of processing the

extension information, determining a procedure for processing the extension information according to a value set in the consistency state management information before processing the extension information corresponding to the directory and the file.

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22. A program for controlling a reproduction operation of a reproduction apparatus for reproducing information from the recording medium according to claim 12, the program comprising an instruction for causing the reproduction apparatus to execute:

10 reproducing the information from the recording medium;
 processing the file system information;
 processing the extension information; and
 processing the contents management information,

 wherein the program comprises an instruction for causing the
15 reproduction apparatus to execute, in the step of processing the
 extension information, determining a procedure for processing the
 extension information according to whether or not the first update
 date-and-time information matches the second update date-and-time
 information before processing the extension information corresponding to
20 the directory and the file.

23. A program providing medium recording the program according to any one of claims 17 to 22 on a medium.

25 24. A data structure recorded on a recording medium, comprising:
 file system information for managing contents information
 recorded on the recording medium as a directory hierarchy structure
 capable of being referenced using a path name;
 contents management information for managing the directory
30 and the file; and

extension information with respect to the directory and the file,
wherein the contents management information includes:

media object management information for referencing the
directory and the file using object reference information obtained by
5 converting the path name; and

extended object management information for managing
the extension information,

wherein the directory and the file are associated with the
extension information via the object reference information.

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25. The data structure according to claim 24, wherein the extended
object management information includes consistency state management
information for managing a state of the directory and the file with the
extension information corresponding thereto.

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26. The data structure according to claim 25, wherein

the consistency state management information is provided for
each media object management information, and

the consistency state management information includes, for each
20 extension information, at least information indicating the presence or
absence of reference relationship from the extension information to the
directory and the file, and information indicating whether or not the
consistency of the directory and the file with the extension information
corresponding thereto is assured.

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27. The data structure according to claim 24, wherein

the contents management information includes first update
date-and-time information,

the extension information includes second update date-and-time
30 information,

when the consistency of the directory and the file with the extension information corresponding thereto is assured, the same value is recorded in the first update date-and-time information and the second update date-and-time information.